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TITLE OF THE INVENTION

PRINTER

BACKGROUND OF THE INVENTION

The present invention relates to a printer which
5 prints an image and/or character on a paper sheet
based n printing jobs sent from networked personal
computers.

In general, a printer used in an office or the like is networked to a plurality of personal computers via a printer server. The printer server receives and stores printing jobs sent from the respective personal computers. At the same time, the printer executes the printing jobs in the order in which the printer server receives them, and prints an image and/or characters on a paper sheet.

However, it is known that, in the case where the printing jobs include printing on a special paper sheet other than a normal paper sheet, such as a thick paper sheet or a tab paper sheet, jamming is liable to occur during the printing on the special paper sheet. When jamming occurs, the printing job is interrupted, while the user is unaware of it. Further, when the printing jobs including special paper printing are processed, if a special paper sheet is not set in a paper feed cassette or a manual feed tray, the printing job may be interrupted, while the user is unaware of it.

If the printing jobs are interrupted as mentioned

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above, successive printing jobs continuously stored in the printer server cannot be executed until someone recognizes and copes with the jamming or sets a special paper sheet.

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BRIEF SUMMARY OF THE INVENTION

The present invention was made in consideration of the above matters and its object is to provide a printer, which has an increased availability factor.

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To achieve the above object, a printer according to an embodiment of the present invention comprises a receiving section which receives printing jobs from networked personal computers, a storage section which stores the received printing jobs, and a printing section which executes a printing job extracted from the storage section. A control section of the printer determines whether the printing jobs received by the receiving section include special printing, and causes a display section to display a list of the printing jobs including the special printing. The printing section executes the printing job selected from the displayed list by the user through an input section.

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Additional objects and advantages of the invention will be set forth in the description which follows, and in part will be obvious from the description, or may be learned by practice of the invention. The objects and advantages of the invention may be realized and obtained by means of the instrumentalities and

combinations particularly pointed out hereinafter.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING

The accompanying drawings, which are incorporated in and constitute a part of the specification, illustrate presently preferred embodiments of the invention, and together with the general description given above and the detailed description of the preferred embodiments given below, serve to explain the principles of the invention.

FIG. 1 is a schematic diagram showing a print system, in which a printer according to an embodiment of the present invention is networked to a plurality of personal computers;

FIG. 2 is a block diagram showing a structure of the printer incorporated in the print system shown in FIG. 1;

FIG. 3 is a flowchart for explaining operations of the printer shown in FIG. 2;

FIG. 4 is a flowchart for explaining operations of the printer shown in FIG. 2; and

FIG. 5 is a flowchart for explaining steps of the receiving process shown in FIG. 3.

DETAILED DESCRIPTION OF THE INVENTION

An embodiment of the present invention will now be described in detail with reference to the drawings.

FIG. 1 shows a print system 100 in which a printer 1 according to an embodiment of the present invention

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is networked to a plurality of personal computers (terminals) 10.

The user operates the personal computer 10 to input data necessary for printing, such as an image or character. The personal computer 10 send a command to execute the printing based on the input data to the printer 1 as a printing job. The printer 1 receives and stores printing jobs sent from the respective personal computers, and executes the printing jobs basically in the order in which it receives them.

FIG. 2 shows structural elements of the printer 1 in a block diagram.

The printer 1 has a control section 2, which controls operations of the printer 1. The control section 2 is connected with an operation panel 11 of a touch panel system having a function as a display section 3 and a function as an input section 4, a receiving section 5 which receives printing jobs sent from the personal computers 10, a storage section 6 which stores the received printing jobs, an image processing section 7 which processes page data contained in the printing jobs as necessary, a printing section 8 which executes the printing jobs, and a paper feed section 9 which feeds paper sheets to the printing section 8.

The paper feed section 9 comprises two paper feed cassettes 9a and 9b (see FIG. 1) and a manual feed

tray, which is not shown. It also comprises a sensor
90 for sensing the presence or absence of the paper
feed cassettes and the manual feed tray. Not only
normal paper sheets but also special paper sheets, such
5 as tab paper sheets, can be set in the paper feed
cassettes 9a and 9b and the manual feed tray. The tab
paper sheet refers to a rectangular paper sheet having
a tab integrally protruded from one side of the sheet.
Besides the tab paper sheets, the special paper sheets
10 include thick paper sheets or foreign paper sheets
(made in the United States, China, etc.).

The control section 2 also serves as a determining
section of the present invention, which determines
whether the printing jobs received through the
15 receiving section 5 include printing on a special paper
sheet, such as a tab paper sheet (hereinafter referred
to as special printing). In this description,
printing, which causes jamming more easily as compared
to the printing on normal paper sheets, is referred to
20 as special printing.

The storage section 6 stores all printing jobs
received from the personal computers via the receiving
section 5. In particular, it stores a specific
printing job, which is determined by the control
25 section 2 as including special printing, separately
from the printing jobs that do not include special
printing.

determined that there is no subsequent page data in the step 27 (the step 27; NO), a notice of end of sending the printing job is received and the operation is ended (a step 28).

5 In the receiving process of the step 2 (i.e., the steps 21 to 28), the control section 2 determines whether the received printing job includes special printing (a step 3). If it is determined in the step 3 that the printing job does not include special printing
10 (the step 3; NO), the printing job is read from the storage section 6 and immediately executed by the printing section 8, and a normal printing process is performed (a step 4).

 To the contrary, if it is determined in the step 3
15 that the printing job includes special printing (the step 3; YES), the printing job is not executed but held in the storage section 6 (a step 5). In other words, printing jobs including special printing are accumulated in the storage section 6 without being
20 executed.

 Then, a list of the printing jobs including the special printing stored in the storage section 6 is displayed through the display section 3 (a step 6). In the state where the printing jobs including the
25 special printing are thus displayed as a list through the display section 3, the user's instruction for execution of a printing job is waited for.

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the step 24 includes information on special printing. The information on special printing includes a tab paper flag representing that printing on a tab paper sheet should be performed, information on a paper feeder, size information, etc.

The printers are divided broadly into two types.

In a first type, the printer executes a printing job after completion of the process of receiving the printing job. In this type, it is determined whether a page index including special printing is received, when the printing job reception is completed. If there is no page index including special printing in the received printing job, the printing job is stored in the storage section 6 and immediately executed by the printing section 8. If there is a page index including special printing, the printing job is stored in the storage section 6 and displayed through the display section 3.

In a second type, each time the printer receives page data in the step 25 during the process of receiving the printing job, it sends the page data to the printing section 8 to print the page. In this type, if the printing job is already being executed when it is determined that the page index includes information on special printing in the receiving process, the printing job is interrupted and the process is shifted to the step 5 shown in FIG. 3.

Alternatively, if the printing job has not been executed when it is determined that the page index including special printing is received, the process is immediately shifted to the step 5.

5 In a second embodiment, it is determined during the printing job receiving process of the step 2 whether the job index of the printing job received in the step 22 includes information on special printing. In this case, when it is determined that the job index including special printing is received, the process is
10 shifted to the step 5.

 Thus, according to the embodiments described above, when the printer 1 receives a printing job including printing on a special paper sheet such as
15 a tab paper sheet, the printer does not immediately execute the printing job but stores it in the storage section 6 and displays it through the display section 3. Then, the printing job is read from the storage section 6 and executed by the printing section 8 on
20 condition that the instructions for execution of the printing job is made through the input section 4 by the user.

 Therefore, if a special paper sheet for use in the printing job, for example, a tab paper sheet is
25 not prepared or jamming occurs during the printing on a special paper sheet, the user can immediately deal with the problem, since he/she is present close to

the printer 1. Accordingly, it is possible to significantly reduce the time in which the subsequent printing job is withheld because of an unnoticed paper-out condition or jamming. As a result, the availability factor of the printer can be increased.

In addition, since the storage section 6 of the printer 1 holds the printing jobs including special printing and the list thereof is displayed, the user can come to the printer 1 at suitable timing and make it execute the printing job. Thus, the convenience is increased. Further, when the printing job is executed, special printing can be performed on trial, or the printing position relative to the tab can be adjusted in view of the tab paper sheet actually output.

Additional advantages and modifications will readily occur to those skilled in the art. Therefore, the invention in its broader aspects is not limited to the specific details and representative embodiments shown and described herein. Accordingly, various modifications may be made without departing from the spirit or scope of the general inventive concept as defined by the appended claims and their equivalents.

For example, the printer 1 may notify the user's personal computer of the timing when the user should make the printer 1 execute the printing job including special printing. In other words, the personal computer of the user may be notified that special

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printing is included in the printing job sent to the printer 1 by the user, and also notified of the number or order of printing jobs including special printing sent by another user.